

### ABSTRACT

A very high data rate telemetry system is provided for use in a wellbore. In  
5 a described embodiment, a telemetry system includes multiple nodes positioned  
in the wellbore and distributed over a substantial length of the wellbore. The  
nodes simultaneously communicate with a remote location at a very high  
combined data transmission rate. A method of communicating data in a wellbore  
is also provided. The method includes the steps of installing multiple modems in  
10 the wellbore, installing a remote modem at a location remote from the downhole  
modems, and simultaneously communicating data from each of the downhole  
modems to the remote location. Each downhole modem communicates with the  
remote modem using a unique set of frequency subchannels.